

Serial No. 09/881,404

Amendment and Response dated March 30, 2005

Reply to Office Action mailed January 4, 2005

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal comprising:

receiving an audio frame sampled at an audio sampling rate at a digital signal processor;

temporarily storing the ~~[[an]]~~ audio frame ~~sampled at an audio sampling rate~~ in the ~~[[a]]~~ digital signal processor ~~(DSP)~~ prior to encoding;

setting the encoding parameters of the ~~[[a]]~~ digital signal processor prior to receiving a start command from a host;

receiving the start command from the host instructing the digital signal processor to begin encoding the audio frame in response to a first video synchronization signal;

receiving the first video synchronization signal at the digital signal processor;

encoding the same audio frame at the audio sampling rate at which the audio frame was received upon receiving the first video synchronization signal.

2. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, further comprising transmitting a boot command from the host to the digital signal processor.

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3. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 2, wherein the boot command resets a buffer of the digital signal processor DSP along with a controller.
4. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 2, wherein the controller is operable to accept and transfer the audio frame and communications from and to the encoder.
5. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 2, wherein the buffer is operable to store and transfer the audio frames.
6. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 2, wherein the boot command activates a program interface that facilitates communications between the host and the digital signal processor DSP.
7. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 2, further comprising sending a ready

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signal from the digital signal processor DSP back to the host confirming the execution of the boot command.

8. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, further comprising transmitting video synchronization signals to the audio encoder.

9. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, further comprising communicating a plurality of encoding characteristics of the audio frame to the host.

10. (Previously Presented) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 9, wherein the encoding characteristics reflect the frequency and the audio sampling rate of the audio frame.

11. (Previously Presented) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 10, wherein the audio sampling rate of the audio frame corresponds to its rate of compression.

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12. (Previously Presented) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, further comprising sending a preparatory command to the encoder that sets a plurality of encoding parameters of the encoder according to the encoding characteristics of the audio sampling frame.
13. (Previously Presented) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, wherein the encoding parameters reflect characteristics of the audio frame such as frequency and the audio sampling rate.
14. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, wherein host uses the encoding characteristics to establish new encoding parameters, use default encoding parameters or repeat the encoding parameters from a previous application.
15. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, wherein the first video synchronization signal is the next generated video synchronization signal immediately following the transmission of the start command from the host.

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16. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, further comprising transmitting a status signal back to the host when the encoding parameters of the encoder are set.

17. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, wherein the beginning of the audio encoding process coincides with the same video synchronization signal that marks the beginning of the video encoding process.

18. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 1, wherein the host is any suitable microprocessor.

19. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal comprising:

receiving a first video synchronization signal;

receiving a stop command from a host instructing a digital signal processor to count a the number of audio samples of the audio frame occurring subsequent to an the occurrence of a second video synchronization signal;

receiving a second video synchronization signal at the digital signal processor; and

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counting the number of samples of an audio frame representing a time duration equal to the difference between the second video synchronization signal and a last encoded sample of the audio frame; and

discarding the counted samples prior to combining the remaining portion of the audio frame with the video frame in anticipation of playback.

20. (Canceled)

21. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, wherein the counted samples contain encoding instructions.

22. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, wherein the ending of the audio encoding process coincides with the same video synchronization signal that marks the ending of the video encoding process.

23. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, wherein the host is any suitable microprocessor.

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24. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, wherein the stop command further instructs the digital signal processor DSP to cease encoding processes upon encoding the last sample of the audio frame.
25. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, further comprising transmitting the encoded audio frame to a multiplexor to be combined with a corresponding video frame.
26. (Original) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, further comprising transmitting video synchronization signals to the audio encoder.
27. (Previously Presented) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 19, wherein the second video synchronization signal is the next generated video synchronization signal immediately following the transmission of the stop command from the host.
28. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal, comprising:

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an audio generating means for generating an audio frame at an audio sampling rate;

a video generating means for generating a video frame and a plurality of video synchronization signals;

a digital signal processor operable to temporarily store the audio frame, then encode the audio frame at the audio sampling rate in response to a first video synchronization signal, wherein the first video synchronization signal is the next generated video synchronization signal immediately following the transmission of a start command from the host, wherein the digital signal processor includes a number of registers for storing data being processed, an arithmetic and logic unit for performing logical operations as well as arithmetic operations, and a parallel-connected bit shifting unit for performing bit shifting and masking; and

a host microprocessor operable to send command signals to, and to set the encoding parameters of the digital signal processor application.

29. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 28 [[27]], wherein the digital signal processor must first receive a start command from a host prior to encoding the audio frame.

30. (Canceled)



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31. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 28 [[27]], wherein the digital signal processor DSP comprises an encoder, a buffer and a controller.

32. (Canceled)

33. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 28 [[30]], wherein the controller is operable to accept and transfer audio frames and communications from and to the encoder.

34. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 28 [[30]], wherein the buffer is operable to store and transfer audio frames.

35. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 28 [[27]], wherein a plurality of video synchronization signals are generated periodically.

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36. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 28 [[27]], wherein the digital signal processor transmits the audio frame to the multiplexor upon encoding the audio frame.

37. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 28 [[27]], including a programming interface present between the digital signal processor and the host to facilitate communication of a plurality of commands and status signals.

38. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to [[above]] claim 37 [[36]], wherein the status signals include responses from the digital signal processor to host confirming the execution of the host's instructions.

39. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to the claim 28 [[36]], wherein the plurality of commands include communications from the host microprocessor to the digital signal processor authorizing the execution of processing functions, requesting status signals and setting encoding parameters.

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40. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 28 [[27]], further comprising a demultiplexor means for separating the audio signal and the video signal from a multiplexed signal in accordance with a control signal, prior to generation.

41. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal, comprising:

an audio generating means for generating an audio frame;

a video generating means for generating a video frame and first and second video synchronization signals, wherein the second video synchronization signal is the next generated video synchronization signal immediately following a stop command from the host;

a digital signal processor (DSP) operable to count a number of samples of an audio frame representing a time duration equal to a difference between the second video synchronization signal and a last encoded sample of the audio frame in response to receiving the [[a]] stop command, wherein the digital signal processor includes a number of registers for storing data being processed, an arithmetic and logic unit for performing logical operations as well as arithmetic operations, and a parallel-connected bit shifting unit for performing bit shifting and masking;

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a host microprocessor operable to generate and transmit the start command to the digital signal processor; and

multiplexor means for combining the encoded audio signal with the video signal.

42. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 41 ~~[[40]]~~, wherein the digital signal processor transmits to the host a value corresponding to the time required to process the counted audio frames.

43. (Canceled)

44. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 41 ~~[[40]]~~, wherein the digital signal processor DSP comprises an encoder, a buffer and a controller.

45. (Canceled)

46. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 41 ~~[[43]]~~, wherein the host

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microprocessor controller is operable to accept and transfer audio frames and communications from and to the digital signal processor encoder.

47. (Currently Amended) A method of synchronizing a digital audio signal with a corresponding digital video signal according to claim 44 [[43]], wherein the buffer is operable to store and transfer audio frames.

48. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 41 [[40]], wherein a plurality of video synchronization signals are generated periodically.

49. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 41 [[40]], wherein the digital signal processor transmits the audio frame to the multiplexor means upon encoding the audio frame.

50. (Currently Amended) A data transmission apparatus for synchronizing an audio signal with a video signal according to claim 41 [[40]], including a programming interface present between the digital signal processor and the host microprocessor to facilitate communication of a plurality of commands and status signals.

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51. (New) A method of synchronizing a digital audio signal with a corresponding digital video signal comprising:

receiving a first video synchronization signal;

receiving a stop command from a host instructing a digital signal processor to count a number of audio samples of the audio frame occurring subsequent to an occurrence of a second video synchronization signal;

receiving a second video synchronization signal at the digital signal processor, wherein the second video synchronization signal is the next generated video synchronization signal immediately following the transmission of the stop command from the host; and

counting the number of samples of an audio frame representing a time duration equal to the difference between the second video synchronization signal and a last encoded sample of the audio frame.